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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,741	07/27/2006	Remo Meister	5503-061852	3550

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EXAMINER

RAHIM, AZIM

ART UNIT	PAPER NUMBER
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3784

NOTIFICATION DATE	DELIVERY MODE
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04/05/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@webblaw.com

Office Action Summary	Application No. 10/587,741	Applicant(s) MEISTER, REMO	
	Examiner AZIM RAHIM	Art Unit 3784	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 May 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 27-29, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (Tanaka, US 6,116,035) in view of Menin et al. (Menin, US 5,970,732).

Regarding claims 27 and 31, Tanaka discloses a refrigeration plant and operating method (referring to figure 44), which comprises in a refrigeration circuit (A) a compressor (11), a condenser (14), an injection valve (18) and an evaporator (the combination of cooling heat exchanger 15 and cold heat source heat exchanger 2), which is passed through on its secondary side (2) by a secondary medium (via refrigerant circuit B) to be cooled down, whereby a heat exchanger (the combination of heating heat exchanger 12 and hot heat source heat exchanger 1)

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is provided between a feed line (the line at the bottom of cold heat source heat exchanger 2) for the secondary medium and a refrigerant line leading to said injection valve (the line at the top of cooling heat exchanger 15), such that said heat exchanger is positioned directly upstream of the entrance of said injection valve (illustrated in figure 44). However, Tanaka fails to disclose that the temperature of the refrigerant at the entrance of the injection valve is kept constant. The general concept of maintaining the temperature of a refrigerant upstream of an expansion valve falls within the realm of common knowledge as obvious mechanical expedient and is illustrated by Menin (referring to figure 1) which teaches a thermal expansion valve (7) that maintains a constant temperature superheating value of a refrigerant vapor after a liquid separator (3) (see column 6, lines 31-34), and one having ordinary skill in the art would have been motivated to include the use of maintaining the temperature of a refrigerant upstream of an injection valve constant in order to control the superheat of the evaporator, thus ensuring efficient operation of the refrigerant plant.

Regarding claims 28 and 32, Tanaka further discloses that the mass flow of the cooled-down secondary medium is at least partly passed through the heat exchanger in counter-flow with respect to the refrigerant flow (illustrated in figure 44) by means of a first valve (the valve disposed above cold heat source side heat exchanger 2).

8. Claims 29, 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka as modified by Menin as applied to claims 27 and 31 above, and further in view of Aflekt et al. (Aflekt, US 7,574,874).

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Regarding claims 29, 30 and 33, Tanaka as modified by Menin teach all the limitations of the claimed invention, but fails to teach that the refrigerant leaving said evaporator is passed through an internal heat exchanger, and whereby a second valve is provided between said refrigerant line leading to said injection valve and said internal heat exchanger, such that a predetermined part of the refrigerant mass flow is passed through said internal heat exchanger, while the remaining mass flow is directly conducted to said injection valve, to additionally keep the temperature of the refrigerant at the entrance of the injection valve. Aflekt teaches (referring to figure 3) an internal heat exchanger (5) positioned downstream of an evaporator (4), and a three-way valve (6'') positioned between an injection valve (expansion valve 3) and a refrigerant line leading to the internal heat exchanger (the line at the bottom of the three-way valve). It is noted that a user would know the predetermined amount of refrigerant flow passing through the three-way valve based on the specifications of the refrigerant circuit of Aflekt. Also, the three-way valve would inherently aid in keeping the temperature of the refrigerant entering the expansion valve constant, since some of the refrigerant is allowed to bypass the expansion valve. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerant plant of Tanaka as modified by Menin to include the internal heat exchanger and three-way valve as taught by Aflekt in order to control the superheat of the compressor, thus ensuring efficient operation of the refrigerant plant.

Response to Arguments

3. Applicant's arguments filed 11/29/2010 have been fully considered but they are not persuasive.

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On pages 5, 7 and 8 of the applicant's remarks, the applicant presents the following arguments:

(a) However, as can be seen from Fig. 45, the heat exchanger (1, 12) is not arranged in a refrigerant line leading to the injection valve (18b) of the refrigeration circuit (A), but it is arranged in the refrigerant line leading to a different injection valve (18a). Accordingly, this heat exchanger (1, 12) is by no means able to keep the temperature of the refrigerant at the entrance of injection valve (18b) constant.

(b) Additionally with regard to Fig. 45 in Tanaka, Applicant submits that the Examiner's proposed flow of refrigerant in the Tanaka system differs from the claimed method because Tanaka fails to disclose that the heat exchanger is positioned directly upstream of the entrance of the injection valve. According to the Examiner's interpretation of the refrigerant flow in the Tanaka system, the refrigerant would flow through the heat exchanger (12) and the expansion valve (18a) and enter a closed loop comprising a heat exchanger (15), compressor (5), heat exchanger (14), and injection valve (18b). For the Examiner's convenience, annotated Fig. 45 of Tanaka is reproduced below, illustrating the proposed refrigerant flow with arrows.

(c) As explained in the Tanaka patent (column 64, lines 23-51), item (17) denotes only a bypass passage with a heat amount adjusting heat exchanger (14). The main primary refrigerant circuit (A) comprises a compressor (11), a condenser (12), an expansion valve (18a), and an evaporator (15). Accordingly, there is no means between the condenser (12) and the expansion valve (18a), which is passed by a secondary medium to keep the temperature at the entrance of the injection valve (18a) constant, as in claims 27 and 31 of the present application. Additionally,

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the heat exchanger is not positioned directly upstream of the entrance of the injection valve.

Accordingly, Tanaka fails to teach or suggest each and every feature of the claimed invention.

(d) Similarly, the Pomme reference also fails to teach or suggest the elements not found in Tanaka. The Pomme patent, as illustrated in Fig. 3, teaches a completely different air conditioning circuit. The central part of the circuit, which is a so-called preliminary pressure reduction device (4), is positioned in the refrigeration circuit between the condenser (3) and a vessel (5).

(e) As explained in the Tanaka patent (column 64, lines 23-51), item (17) denotes only a bypass passage with a heat amount adjusting heat exchanger (14). The main primary refrigerant circuit (A) comprises a compressor (11), a condenser (12), an expansion valve (18a), and an evaporator (15). Accordingly, there is no means between the condenser (12) and the expansion valve (18a), which is passed by a secondary medium to keep the temperature at the entrance of the injection valve (18a) constant, as in claims 27 and 31 of the present application. Additionally, the heat exchanger is not positioned directly upstream of the entrance of the injection valve. Accordingly, Tanaka fails to teach or suggest each and every feature of the claimed invention.

(f) Similarly, the Pomme reference also fails to teach or suggest the elements not found in Tanaka. The Pomme patent, as illustrated in Fig. 3, teaches a completely different air conditioning circuit. The central part of the circuit, which is a so-called preliminary pressure reduction device (4), is positioned in the refrigeration circuit between the condenser (3) and a vessel (5).

(g) For these reasons, method claim 27, as amended, and apparatus claim 31 are believed to be patentably distinct over the teaching of the Tanaka patent in view of the teaching

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of the Pomme patent. By way of their dependence upon what are believed to be patentably distinct claims 27 and 31, dependent claims 28-29 and 32-33 are themselves believed to be patentably distinct over the teaching of the Tanaka patent alone or in combination with the teaching of the Pomme patent.

(h) In Section No. 8 of the Office Action, the Examiner rejects claims 29, 30, and 33 under 35 U.S.C. § 103(a) as being obvious from the teaching of the Tanaka patent in view of the teaching of the Pomme patent, and further in view of the teaching of United States Patent No. 7,574,874 to Aflekt, et. al. By way of their dependence upon what are believed to be patentably distinct claims 27 and 31, dependent claims 29, 30, and 33 are themselves believed to be patentably distinct over the teaching of these references.

In response to the aforementioned arguments, the Examiner respectfully disagrees.

In response to arguments (a)-(c), as described above in the rejection of claim 29, the Examiner has now relied upon figure 44 of Tanaka instead of figure 45. As shown in figure 44, injection valve 18 is positioned directly downstream of heat exchanger combination 12 & 1, since the valve is the next device downstream of the heat exchanger. Therefore, the heat exchanger is positioned directly upstream of the injection valve. In addition, as stated in the rejection of claim 27, newly introduced reference Menin, not Pomme, referring to figure 1, teaches a thermal expansion valve 7 that maintains a constant temperature superheating value of a refrigerant vapor after a liquid separator 3 as disclosed in column 6, lines 31-34, and one having ordinary skill in the art would have been motivated to include the use of maintaining the temperature of a refrigerant upstream of an injection valve constant in order to control the superheat of the evaporator, thus ensuring efficient operation of the refrigerant plant. This

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teaching is sufficient as a means of keeping the temperature of the entrance of the expansion valve constant.

Also, response to argument (c), the applicant does not claim any device positioned between a condenser and an expansion valve to keep the temperature of the entrance of the expansion valve constant.

In response to arguments (d) - (f), as stated in the rejection of claim 27, newly introduced reference Menin (referring to figure 1) teaches a thermal expansion valve (7) that maintains a constant temperature superheating value of a refrigerant vapor after a liquid separator (3) (see column 6, lines 31-34), and one having ordinary skill in the art would have been motivated to include the use of maintaining the temperature of a refrigerant upstream of an injection valve constant in order to control the superheat of the evaporator, thus ensuring efficient operation of the refrigerant plant. This teaching is sufficient as a means of keeping the temperature of the entrance of the expansion valve constant. In addition, nothing prevents the examiner from introducing a teaching that may require that additional parts be added to Tanaka. The Pomme reference was replaced by Menin. Therefore, all of the limitations of claim 27 are properly taught by the combination of Tanaka & Menin.

In response to arguments (g) & (h), the applicant is advised to see the Examiner's response to the arguments set forth in sections (a) – (f). Therefore, the rejections of these claims are proper.

In conclusion, for at least the reasons stated above, the Examiner respectfully submits that the rejections of the pending claims are properly upheld.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIM RAHIM whose telephone number is (571) 270-1998. The examiner can normally be reached on Monday - Thursday 7am - 2pm EST and Friday 7am - 11am EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules or Cheryl Tyler can be reached on 571-272-6681 and 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. R./

Examiner, Art Unit 3744

3/20/2011

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744